

PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

Improvements in or relating to Artificial Limb Sockets.

I, THOMAS BRYANT SMITH, a British subject, of 26, Langham Street, Portland Place, London, W. 1, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to artificial limb sockets, and although primarily intended for application to sockets for artificial legs amputated above the knee, is also applicable to sockets of other kinds and for other limbs.

In order to avoid the necessity for braces or other harness for securing the socket in position upon the stump in the case of an above-the-knee amputation, it has been proposed to employ a socket which fits tightly upon the stump in such manner that it is held thereon by suction, a valve being provided in the socket adapted to be operated automatically or by hand to permit escape and admission of air upon insertion and withdrawal of the stump into or out of the socket. Moreover, it has been proposed to provide such sockets having hand operated valves with an internal helical groove or grooves, to improve the grip of the socket upon the stump, and to ventilate the stump when the wearer sits.

The present invention has for its object to provide an improved construction of suction limb socket, and according thereto the internal surface of the socket, which is made of unyielding material, is provided with one or more closed recesses shaped to fit the contour of the muscles of the stump. In addition the socket may be provided internally with one or more continuous or partial circumferential grooves disposed in planes normal to the axis of the stump. Preferably the socket is provided with a valve normally held closed, but adapted to open automatically or to

be opened mechanically when desired to permit escape and entry of air upon application to or removal of the socket from the stump.

In order that the invention may be clearly understood and readily carried into practice, I have appended hereto one sheet of drawings, illustrating the same, wherein:—

Figure 1 is a vertical section of a portion of an artificial leg, showing one construction of socket according to the invention, and

Figure 2 is a similar view showing another construction of socket.

In Figure 1 the upper portion of the artificial limb consists of a hollow member or socket *a* of wood or other suitable rigid or stiff material, the upper portion of which receives the stump of the leg. This member *a* is closed at its lower end so as to form an air tight socket for the stump, and is provided internally near its upper end with a number of recesses or depressions *d*₁, *d*₂. These recesses or depressions do not communicate with each other or with the mouth of the socket. They may be arranged in any desired formation, and may vary in depth according to nature and size of the muscles in the stump which are received therein. The recesses *d*₁ are shaped to fit the contours of the principal muscles in the stump, whilst the additional recesses *d*₂ are partial or complete grooves formed in planes disposed substantially normal to the axis of the stump.

It should be understood that the recesses *d*₁ may be used alone, i.e. without the grooves or partial grooves *d*₂, and that a single recess *d*₁ need only be employed.

Near its lower end the socket is provided with a ball valve consisting of an outer casing *e* containing a ball *f* normally held by a spring *g* against the opening in the inner end of the casing

[Price 1/-]

e. The outer end of the casing *e* has an intumed annular flange surrounding a central aperture and forming an abutment shoulder for the outer end of the spring *g*. Normally the ball *f* is held tightly against the opening in the inner end of the casing *e* by the spring *g*, but upon insertion of the stump, the ball is moved by the pressure of the air against the action of the spring *g*, thus permitting free escape of the air when the stump is inserted into the socket. Mechanical means may be provided for pressing the ball outwardly to allow air to enter the socket on withdrawal of the stump, or in lieu of an automatic valve an ordinary truncock or hand operated valve may be employed.

The construction of socket illustrated by Figure 2 is similar to that of Figure 1, with the exception that the wooden or like socket *b* closed at its lower end is mounted in a hollow metal casing *c* constituting the upper portion of the limb. Further, the socket *b* is provided with a single more or less V-shaped recess *d*₁ shaped to fit the contour of the principal muscle at the back of the stump. Of course, if desired, one or more complete or partial grooves similar to *d*₂ of Figure 1 may be provided additionally to the single recess *d*₁.

As hereinbefore indicated, the invention is not limited to the particular arrangements and formations of the recesses illustrated in the drawings, and it is not limited to the particular construction of valve described and illustrated.

Having now particularly described and

ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An artificial limb socket adapted to receive the stump of a limb, made of unyielding material, and closed at its lower end, wherein a closed recess or a plurality of closed recesses shaped to fit one or more muscles of the stump is or are formed in the interior surface of the socket.

2. An artificial limb socket adapted to receive the stump of a limb, closed at its lower end, and provided with a valved opening therein, wherein a closed recess or a plurality of closed recesses shaped to fit one or more muscles of the stump is or are formed in the interior surface of the socket.

3. An artificial limb socket according to either of the preceding claims, provided additionally on its inner surface with one or more grooves extending partially or wholly round the socket in a plane substantially normal to the axis of the socket.

4. Artificial limb sockets, substantially as herein described with reference to, and as illustrated by, the accompanying drawings.

Dated this 21st day of April, 1926.

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[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

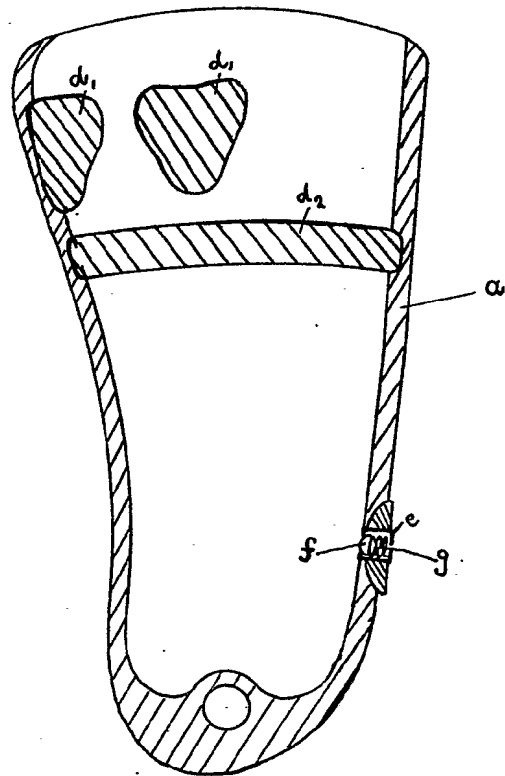


Fig. 2

